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AUTHOR	Otter, Annica, Ed.; Dahlberg, Ullabritt, Ed.
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ABSTRACT

This document provides an overview of the research program of the Swedish National Board of Education (NBE) since 1962. The following subjects are discussed: (1) budget; (2) duration of the various projects; (3) fields of research; (4) transmission of knowledge; (5) transition from management by command to management by objectives; (6) research in the 1960s and 1970s; (7) research in educational technology; (8) local responsibility; (9) secondary school reform; (10) science role research; (11) goal achievement research; (12) adult education; (13) educational environment research; (14) longitudinal studies; (15) educational improvement; (16) sex differences; (17) writing instruction; and (18) standardized achievement tests. Charts illustrate the budget data. (BJV)

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25 years' research into schools and education

Administrative and financial responsibility for research into schools and education has been entrusted to the NBE since 1962. Over the years, all this research has been conducted by higher education establishments. For the past two years or so, research has been funded at a rate of some MSEK 15 annually. Whereas originally it had a distinctly pedagogical emphasis, the NBE research programme now presents a broad profile in the social sciences and humanities.

Research and development work began with a special allocation for "Educational development work etc. in the school system", received by the NBE in 1962. During the sixties and seventies R&D was gradually expanded to include not only the content and results of learning and teaching but also the organisation and social conditions of education.

Following a succession of decentralisation measures over the past 10 years, the NBE now retains prime responsibility for research and central development work in the compulsory school system, upper secondary schooling and adult education. Responsibility for development work in individual schools, on the other hand, has been transferred to county education committees and local schools.

A substantial research budget

Nearly MSEK 30 were allocated for research and central development work this year. Of this money the research programme controls MSEK 15. The remainder is earmarked for central development work, planning, follow-up and information measures, and the central evaluation of upper secondary school reforms.

Research is supported above all through project grants made to individual researchers or to research groups. Today upwards of 70 research projects and more than 20 development projects are in progress in various parts of Sweden. The research programme involves more than 100 researchers, numerous teachers and other school employees, as well as school administrators.

Duration of projects

Projects vary in duration. Some researchers/research groups have received continuous grants for more than 10 years, sometimes under one and the same project, but for the most part within one and the same principal research field. Good research, especially in new fields of research and education, has been successfully developed with a high level of continuity. Other projects are of brief duration. The length of time for which a project continues depends on the nature of the problems which are being studied and on the interests of the researcher/research group. On average nowadays, a project will last for ¼ years. Research is conducted by higher education establishments.

Many different fields

The research programme is divided into a number of fields. "Effects of education on individual and society" deals with the egalitarian aims and effects of education and with questions relating to the equality of the sexes.

The interface between skills development at work and basic education in the public sector school system has interested many researchers. Questions of this kind are studied in the field entitled "Interaction between education, labour market and working life".

"School subjects and school teaching" is the biggest single field of investigation and has always occupied the main focus of attention in the NBE research programme. What, how and why? are the main didactic points of inquiry here.

The following pages provide glimpses of the comprehensive activities involved by the research programme. Two slightly longer articles at the end describe two research fields which have a long history but are always supremely relevant. The first of these concerns the way in which children and young persons experience their school careers and the overall effect of education on the development of adult life. The second is concerned with Swedish language teaching and linguistic development throughout school.

Questions concerning the apportionment of responsibilities and control in the school sector are supremely relevant and are researched in the field "Effects of decentralisation in the school sector".

Schools do not manufacture a "saleable" product, and costing analyses in the school sector are a very difficult undertaking. Attempts are made, however, in the field entitled "School finance and resource utilisation".

The field of "Teacher education, in-service education and personnel development" includes questions relating to teachers' professionalism and to the school working environment in the broad sense.

The main point of inquiry in "The information and research society" concerns the nature and causes of long-term shifts in the basic values of young persons.

Other research fields under the NBE research programme are "Recurrent education, educational attitudes and lifelong learning", "Curricula and syllabi", "The conditions and course of local and regional development work", "The handicapped at school and in the community" and "Immigrants and national minorities".

Trans-boundary research

A research programme designed to cover all the questions occurring in compulsory school, upper secondary school and adult education is liable to be inchoate. Points of inquiry and research requirements greatly exceed the available resources. One of the important tasks of research, consequently, is to identify those questions which are specific to a particular form of education and those which are of general relevance.

Common, general questions–and research projects with them–have increased steadily during the 25 years for which the NBE has been administratively and financially responsible for research and development work. This is very much due to research relating to specific forms of education, which has revealed close connections between them. Research into different parts of the system, in other words, has provided data for an overall picture.

The effects of education on the individual and society are one such general topic. Decades of research, not least within longitudinal, individualised statistical data bases, have yielded material on which to base decision on a succession of vital issues relating to the organisation and content of education and to student finance.

New fields of research

The information and knowledge society is palpably transforming the conditions affecting school work and the content of education. The development of mass media and information technology has revolutionised the conditions attaching to the acquisition of information and knowledge in and out of school. Media developments in particular have also entailed certain risks of a superficial and, in many ways, frightening image of the world at large, potentially harmful to children and young persons.

The transmission of knowledge

The transmission of knowledge must be seen as a continuous process. Events in compulsory school, from the very first day of school, leave their mark on what comes afterwards. Accordingly, cognitive development rather than individual subjects is becoming a progressively more important field of research, as our studies of school as an environment for social and emotional development for the children and young persons who nowadays spend 11 or 12 years there.

From management by command to management by objectives

The substitution of management by objectives for management by command applies to the whole of formal education. Popular education, on the other hand, has always been goal-related. School management, consequently, has become an increasingly important consideration and increasing demands are being made on head teachers. There is also growing insistence on the efficient deployment of resources in schools, not only because those resources have diminished in real terms but also because when resource deployment is governed more closely by actual needs, school management and staff are confronted with difficult questions of priority. Who is to have what?

A school for everybody

There are also two categories in Swedish society which must always receive special attention: the mentally and physically handicapped and, secondly, immigrants and national minorities. In both cases, the majority community must not be allowed to dictate the terms of integration.

"School research" in Sweden during the reforming era which began in the mid-1940s and following the introduction of the comprehensive compulsory school in 1962 was to a great extent research about and in preparation for the new school. That school needed its new teachers, its new teaching materials and an ongoing development of its curriculum and organisation. Compulsory school was an exciting field of research which mainly attracted educational researchers.

Eventful decades

A lot happened during the 1960s and 1970s. Many studies were devoted to the various school subjects–Swedish, mathematics, foreign languages and also more elusive subject fields such as religious education, music and physical education.

A great deal of research effort was also devoted to school organisation and curricula, not least those relating to senior level, the level of compulsory school which has always aroused most interest and been most intensively debated.

Right down until 1977, when teacher education became the responsibility of the National Board of Universities and Colleges, a good deal of research was undertaken on this subject. The projects were almost exclusively concerned with compulsory school teachers–class teachers, subject teachers and special teachers.

The decade of educational technology

The 1960s were also the decade of educational technology, as witness the many methods-and-materials projects–Individualised mathematics teaching (IMU), German teaching methods (UMT), Independent work in upper secondary school (SAG) and Self-instructional materials for special teaching (SISU).

Research was also made to focus on compulsory school organisation and compulsory school as an organisation, on compulsory school development and compulsory school resources.

...in compulsory school

Many studies in the 1960s and 1970s were devoted to various compulsory school subjects. That research is still in progress, but more recently–following the SIA (Swedish acronym for Inner Work at School) resolution and Lgr 80 (the 1980 compulsory school curriculum)– growing interest has been devoted to questions concerning increased local responsibility for compulsory school development.

Local responsibility for development

Today the focus of interest is shifting where compulsory school is concerned. Research is still being done into school subjects and school teaching, and this will always be necessary; without a knowledge of the content of schooling, there can be no understanding of questions relating to the form and organisation of education. But ever since the SIA resolution and Lgr 80, questions relating to increased local responsibility for compulsory school development have also been a topic of research.

How significant is local development work? How is in-service teacher education linked up with local school development? What does the substitution of management by objectives for management by command in the school sector really amount to?

Dual objective

The expression "compulsory school a school for everyone" implies a dual objective. Compulsory school must provide a meaningful education for everybody who has to attend it, and it must also be a school for everybody, i.e. a school where there is increasing room for children and young persons with physical and mental disabilities.

The compulsory school system, which has now been with us for just over 25 years, remains an exciting research field.

...in upper secondary school

A lot is happening in upper secondary school and there are many changes in Progress. This applies both to general and vocational studies. And a great deal of effort is being devoted to research and development in order for upper secondary schooling to measure up to the demands of working life and the community in general.

Upper secondary school is passing through a transformation phase affecting both general (theoretical) and vocational study programmes. Vocational education is faced with demands for renewal from the community at large, where there is a growing demand for elements of educational preparation and general civic instruction. The employment sector, with new forms of organisation and new techniques affecting skills, is also calling for a renewal of vocational education.

The SMART project ("The encounter between schools and the technology of working life") and "Industrial development and professional skill" are two projects concentrating especially on the implications of the new technology for vocational education.

Five-year experiment in progress

Developments in the five-year R&D programme now in progress are being followed up under the project entitled "Reform strategies for the renewal of upper secondary school", through the medium of evaluative reports from researchers, teachers and educational administrators. The renewal strategy chosen is based on local initiatives within a number of centrally defined experimental fields. "Subject-related work experience" and "Co-operation between upper secondary schools and adult education" are two such experimental fields.

It is above all the general theoretical lines (i.e. study programmes) and general subjects of upper secondary school that are affected by the R&D programme. Since reform strategy and development work apply different principles to vocational education and general theoretical education, it is vital to be able to judge the impact of the progress of the experiments on central goals of education policy.

Humanising science

During the 1970s, science studies in upper secondary school came to occupy the focus of debating attention as a result of the socalled "scientist shortage". During the 1980s, a shortage of engineers has caused special attention to focus on basic science education. At the same time the debate on the environment and energy testifies to the importance of maintaining a high level of general civic knowledge in the field of science.

Science must not be allowed to become primarily a matter of specialist knowledge in upper secondary school. Science subjects, in other words, are of pivotal importance to the democratic and professional, credential objectives of upper secondary schooling.

Research into the position of science

For a long time now the NBE has been funding research into the position of science subjects. Three projects of this kind are now in progress. Previous research into the teaching of chemistry and mathematics is being followed up in a project entitled "Attitude to knowledge, content and concept formation in science, technology and mathematics studies in youth education and adult education". The project "Pupils' frames of reference and teaching content" is among other things concerned with the teaching of biology. The "IEA-Science" project is an international joint project, the Swedish part of which comprises physics, chemistry, biology and general science tests in the terminal grades of upper secondary school.

Swedish research into adult education has passed through various stages of development in the last two decades. At the end of the 1960s a great deal of emphasis was put on studies of motivation and recruitment. Research frequently tied in with Anglo-Saxon theories concerning the educational interests, motives and social backgrounds of adults.

During the early 1970s these studies acquired a more distinct native profile since the studies of recruitment could be based on Swedish longitudinal material which was more widely representative than the foreign prototypes. This approach was also employed in the early 1980s, in a more exhaustive follow-up of the adult education reforms of the 1970s.

The importance of education

There will be reason in future to follow up the significance of adult education to the individual and society by means of longitudinal analyses, with special reference to the distributive aims of adult education.

If so, these studies ought to be supplemented in two respects. It is important to shed light, in qualitative terms, on the lifecycle and social biography of individuals. It is also necessary to put participation in adult education in a general context of welfare policy in which the equalisation of educational standards is also related to income equalisation and changing social conditions.

Studies of goal achievement

No less important than the analysis and evaluation of reforms–in terms of the groups attracted and repelled, respectively, by different kinds of adult education–is the elucidation of the educational environment and conditions of learning for groups remaining within an education system.

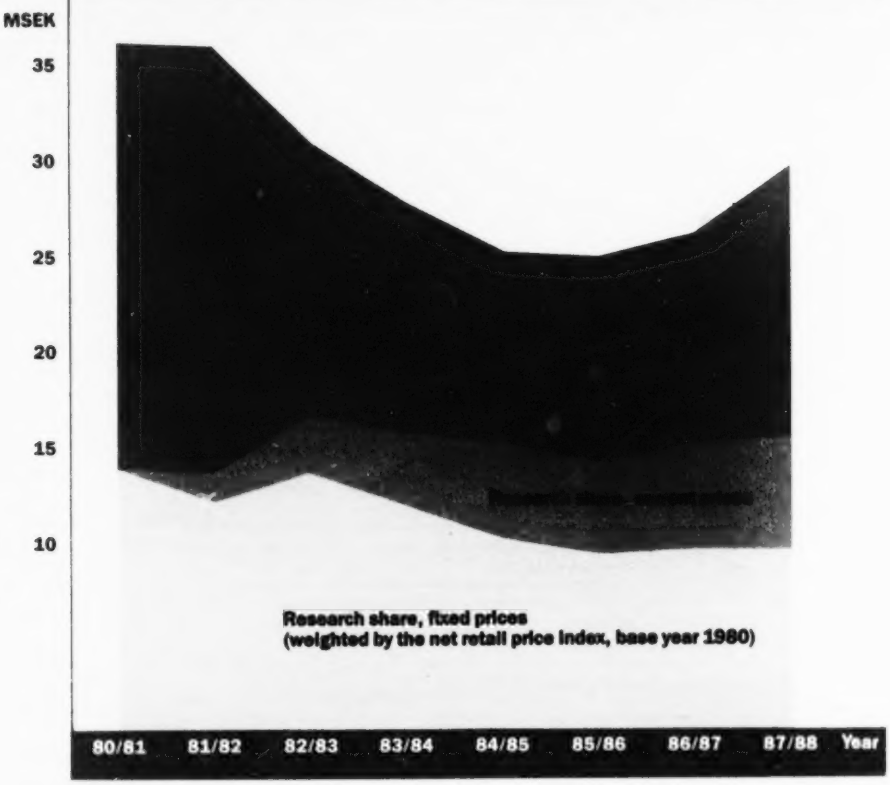
For three years now, studies of goal achievement have been in progress in various sectors of adult

...and adult education

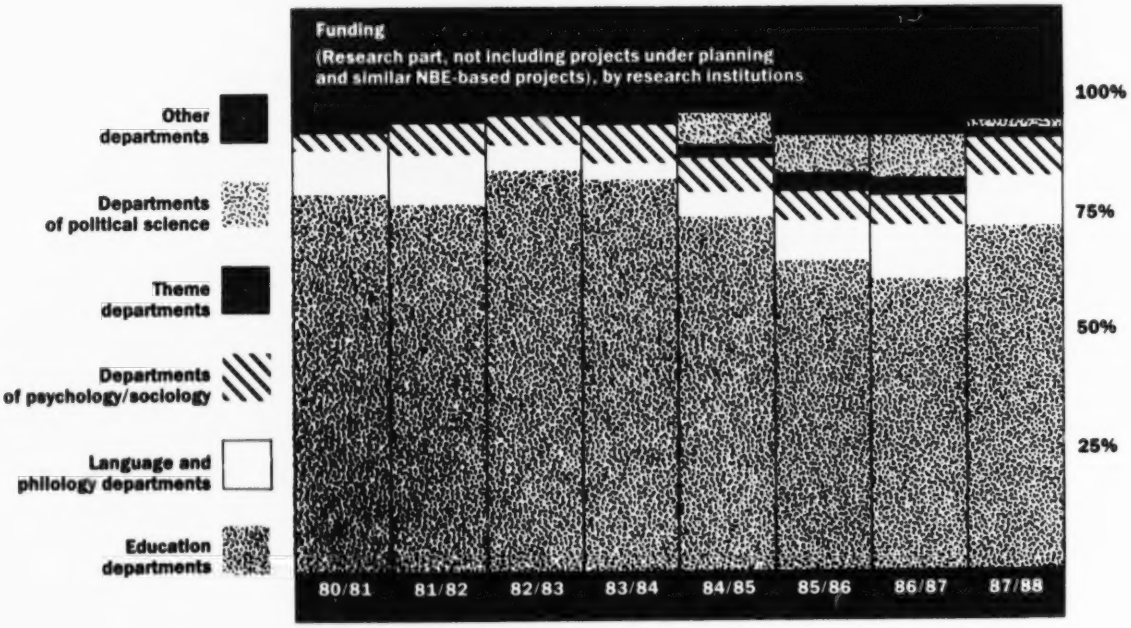
Comprehensive studies of the adult education reforms of the 1970s were undertaken during the early 1980s. Research today is more concerned with elucidating the educational environment and conditions of learning, and with studying goal achievement. Future research into adult education will be very much concerned with the importance of that education to the individual and society.

Research in figures

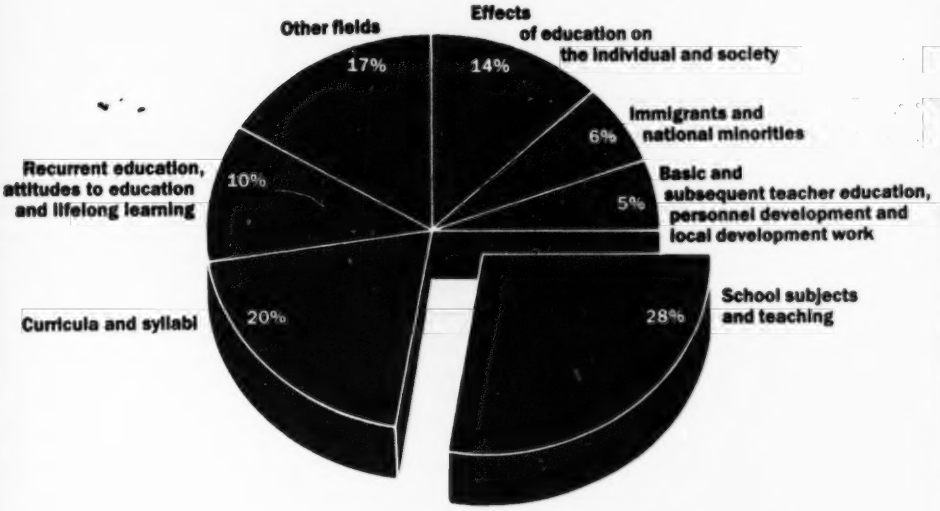
Funding
(Research and central development in the school system)
1980/81–1987/88 and the research share in current and fixed prices



Funding
(Research part, not including projects under planning and similar NBE-based projects), by research institutions



1982/83 Funding (research share) by various subject fields

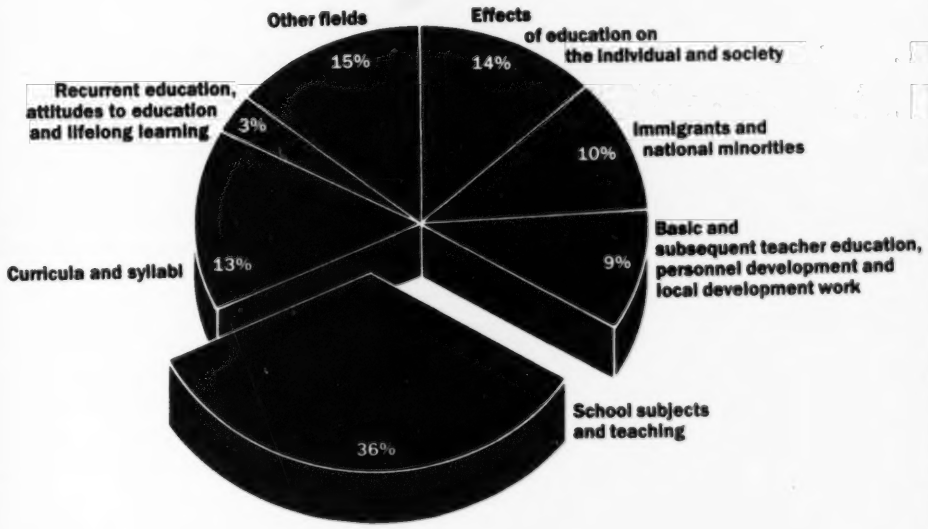


No. projects and average project funding, 1980/81–1987/88 (not including outlined projects)

Year.	No. projects	Average project allocation: Current prices	Fixed prices*
1980/81	62	223,000	220,000
1981/82	49	274,000	244,000
1982/83	53	277,000	227,000
1983/84	47	294,000	225,000
1984/85	41	342,000	244,000
1985/86	47	279,000	187,000
1986/87	50	264,000	170,000
1987/88	52	258,000	161,000

*Weighted with the net retail price index for each year. Base year 1980.

1987/88 Funding (research share) by various subject fields



Planned duration of projects in progress 1987/88 (not including projects under planning)

Duration	No. projects
1 Year	3
2 Years	11
3 Years	17
4 Years	12
5 Years	4
6 Years	1
≥ 7 Years	3
Undecided	1
Total	52

Average 3.2 years
(not including longitudinal projects)

Research project participation in the in-service training of teachers and other school staff 1986/87

Participation in INSET	26 projects
Non-participation in INSET	24 projects

Training of project employees 1986/87 (salaried under the R&D allocation, research share)

	No. WTEs
Professor	3.75
Ass. Prof.	14.5
Ph.D.	9
Research student	24

Project leader training 1986/87

	No.
Professor	18
Ass. Prof.	23
Ph.D.	2
Research student	11

education, e.g. as regards the realisation of the municipal adult education curriculum, basic education as a form of learning, and the environment and teaching methods of folk high school.

Other angles included in current research work are recurrent education as a reforming strategy and regional case studies of the terms of commissioned education.

Developing adult pedagogics

Where forward-looking research is concerned, it will be important to continue the development of adult pedagogics, both with reference to the various forms of education and also in terms of specialised didactics. It is also essential to chart grey zones and new networks between upper secondary school, adult education and higher education –not least with reference to commissioned education and the growth of corporate personnel education. Given this background, questions concerning the structure and control of education supply are bound to constitute a central topic of research and policy-making.

Good results in the education marathon

Swedish 13-year-olds have a higher level of ability today than they did 20 years ago. And the big winners in the "educational Marathon"–compulsory school –are girls. This is shown by research under the project "Evaluation through follow-up of pupils", the UGU project.

There are certain similarities between running in a marathon and going to school. The participants in both "races" start on unequal terms. Those out front get off to a better start than those who are further behind. They have acquired this leading position through earlier qualifications, they have, so to speak, obtained better "marks" in previous events, they are in better training and so on.

Levels of ambition also vary. Some participants are running to win, while for others the main thing is to get to the finishing line. In a marathon, everybody has come to the starting line in order to do their best, but the attention attracted to their achievements and the value put on them will vary a great deal.

What happens during the race?

Marathon runners enrol and start in the race entirely of their own volition, while basic schooling is compulsory. This is one crucial difference. But pupils at school, just like the participants in the race, often refer to their experiences in terms of "succeeding" or "making it".

We cannot find out what happens to the different participants in the marathon merely by looking at the results afterwards. We have to keep track of what happens throughout the race. This too is the basic principle of the UGU project, the full title of which is "Evaluation through follow-up of pupils".

School as an educational environment

The UGU project views pupils' experience in relation to their aptitudes. This is where the evaluative perspective of the project comes in. But it is not primarily the achievements of individuals that are evaluated. Instead it is the way in which schools measure up to the aim of giving pupils with different aptitudes the best possible opportunities for development.

These studies are also concerned with evaluating school as an educational environment. The main focus of attention is on the goals which may be termed conducive to equality. In what respects do we succeed in giving "equivalent education" to individuals with different aptitudes? To find out the answers to questions like these, one has to follow the progress of the individuals throughout their education and, preferably, afterwards as well.

1800 participants

The UGU project is being directed from the Stockholm Institute of Education, in association with Statistics Sweden (SCB). It forms part of the central evaluation of the school system.

This project involves pupils from two annual cohorts. The first of these comprises pupils who were in grade 6 of compulsory school in the 1979/80 school year, most of them born in 1967. The second cohort consists of pupils who in the spring of 1982 were in grade 3. Most of the pupils in this group were born in 1972, which makes them five years younger than the pupils in the first group. The pupils were attending schools in 29 selected municipalities when the study began, but since then they have fanned out to more than 100 municipalities.

Each of the two samples includes roughly the same number of people as every Stockholm Marathon–just over 9,000.

Data from various quarters

Some data are being collected from school offices, e.g. marks, elective subjects, course preferences. supportive measures and special education. Other data are being collected from the pupils and their parents, by means of a questionnaire and tests. The questions are concerned with attitudes to school and school work, interests, plans for the future, employment and continuing edcation.

One year after the pupils have left compulsory school, they are asked questions about the value they put on their own basic skills and whether school has given them sufficient training. The tests administered in grades 6, both in 1980 and in 1985, are identical with those previously used in the Individual Statistics project and are ability tests–verbal, spatial and one inductive test. Achievement and proficiency tests have also been used.

Data for many years

The UGU project supplements the Individual Statistics project which was started already in the early 1960s by SCB and Göteborg University, partly with support from the NBE. The first collection of data for the IS project took place in the spring term of 1961, for pupils born on the 5th, 15th and 25th of any month in 1948. These data, for about one-tenth of the annual cohort, were supplemented by annual data until 1969. Since then, data have been collected on several occasions, most recently at the beginning of the present decade.

Five years after the first collection of data, another collection was performed, this time for pupils born on 5th, 15th and 25th of any month in 1953, and these data were supplemented up to and including 1982. The first random sample comprised about 12,000 pupils, the second about 10,000.

13-year-olds know more today

The UGU project used exactly the same tests as had been used on pupils of the same age during the 1960s in the Individual Statistics project, which meant a unique opportunity for comparisons over time. The outcome, briefly, was that 13-year-olds in 1980 scored better than 13-year-olds in 1961 and 1966. In other words, the level of ability had gradually risen during the intervening 20-year period.

Still more interesting than this overall result are the comparisons which were possible between different groups of pupils. In the 1960s, children whose parents' jobs demanded post-compulsory education did better in tests on average than pupils whose parents belonged to other occupational categories. This difference was undiminished in 1980. On average, then, all groups had improved their scores by the same amount.

Girls have advanced

The comparison between boys' and girls' scores, however, points to changes. In the verbal test there were no differences between 13-year-old girls and boys in the 1960s. In 1980 the girls did appreciably better than the boys. In the other two tests the boys did better than the girls in the 1960s, but this difference no longer existed in 1980.

Boys and girls have both improved their performance, judging by the 1980 test results and compared with scores about 20 years earlier, but the girls, then, have made more headway than the boys.

Swedish at all ages

Studies have revealed the important influence exerted by children's early language development on reading and writing in school, and also that intermediate level is a very important period in children's language development.

Beneficial to children's language development is e.g. parents reading stories to their children and stimulating them to borrow books from libraries.

Languages, and the Swedish language in particular, have formed the subject of numerous and extensive research projects over the years. The Department of Educational Research at the Malmö School of Education has been researching Swedish as a discipline and the teaching of Swedish for more than twenty years now. The participants in the various projects have ranged from 4-year-olds to adults.

The spoken language of children between the ages of 4 and 6 has been charted by registering both pronunciation, vocabulary and syntax. Studies have revealed the important influence exerted by children's early language development on reading and writing in school.

How do children acquire a good language? There are of course many factors involved. Research has shown that the following circumstances are bound up with children's language development: maternal and paternal education and employment, dwelling space, number of rooms in the home and language problems among next-of-kin. These facts were already known and are more likely to inspire defeatism than confidence.

Parents can derive more hope from data identifying conditions beneficial to children's language development. These are: parents helping the child to speak correctly, reading stories, borrowing books for their children from libraries, and children having books and records of their own.

This shows that every family can give children a good language by guiding them into constructive activities.

Older children's written work

The language used by somewhat older children in freely written essays is being researched under the project "Free composition at the intermediate level of compulsory school" (FRIS). One of the most surprising results of this research is that assessments of children's essays are greatly dependent on their written productivity. Putting it more brutally, assessments depend on the length of essays, i.e. the number of words they contain.

This finding, however, may also mean that the persons responsible for assessment–the teachers–are more concerned with substance than with a particular form of usage.

Rapid development at intermediate level

Judging by the FRIS findings, intermediate level is a very important period in children's language development. If at the same time one studies conditioning by age, teaching included, and social conditions, there is no mistaking the importance of development in a chronological perspective, whereas social conditions make far less difference.

Nor does research point to any interaction, for example in the sense of children with linguistically deprived backgrounds differing from others in their language development. These results, then, suggest that schools–contrary to

what is sometimes asserted–do not accentuate the differences between children from different social classes.

Written work at senior level and in upper secondary school

The 1965 Upper Secondary School curriculum emphasised that the students were to learn the use of "resilient everyday prose". In studies of the language of upper secondary school students this everyday prose was concretised with the aid of information brochures, articles from daily papers, excerpts from text books and debate articles of the kind often used as "stimulus material" in standardised achievement tests.

Comparisons between these two types of text required a highly comprehensive and penetrating linguistic analysis of both vocabulary and syntax. The comparisons show that upper secondary school students used fewer words and more frequent and shorter words than adult writers, even though they borrow assiduously from the stimulus texts. Syntactically, everyday prose is in fact simpler than upper secondary school students' Swedish in the sense of having fewer subordinate clauses. This means that adults can pack more information into a given space.

In upper secondary school too, long essays were found to score better marks than short ones as a general rule. One reason for this curious state of affairs may be that the long essays contain more viewpoints.

Standardised achievement tests

Responsibility for standardised achievement tests in Swedish for compulsory school, upper secondary school and municipal adult education is also vested in the Malmö School of Education. The test results have shown that there is no evidence of genuine illiteracy among Swedish students. Some entries, however, have shown that one or two pupils have hardly achieved a sufficient command of language to cope with more exacting reading or writing at work or during their leisure.

The results also prompt two other disturbing reflections. One of these is that certain students in the two-year vocational lines of upper secondary school are liable to have less command of language than they did in grade 9 of compulsory school. The other reflection is that the heavy growth of pictorial media output can lead to a decline in verbal skills.

Written work in an international perspective

Pupils in a dozen countries have written free essays on a number of topics. Their achievements are being studied in relation to their backgrounds and other factors.

Head teachers have completed questionnaire forms describing their municipalities and schools. Teachers have reported their teaching routines for written work. Pupils have supplied information on linguistic stimulus in the home and their attitudes to written work. All these things are then viewed in relation to writing ability.

Sweden is taking part in this scheme, commonly known as IEA, under the project "Written Composition". IEA is short for International Association for the Evaluation of Educational Achievement.

In certain cases, comparisons are possible between the various countries. Within Sweden, the IEA project also affords an opportunity for studying the development of writing ability, since the pupils taking part come from grades 6 and 9 of compulsory school and the terminal grades of upper secondary school, added to which certain essay subjects are common to all three age groups.

A Research Committee was set up at the National Board of Education in 1982. The seven members of this committee represent research in the humanities, natural sciences and social sciences. The Research Committee plays an important part as an interface with the scientific community. Its opinions and statements concerning applications for research funds and its expert statements concerning applicants for reasearch appointments do a great deal to influence the NBE's decisions. Meetings of the Research Committee are chaired by the Director-General, with the officials working under the research programme acting as rapporteurs.

Picture below, standing from right: Professors BJÖRN AFZELIUS, KJELL RUBENSON, BENGT ABRAHAMSSON, GÖRAN GRIMVALL, FERENCE MARTON and OLOF RUIN, together with ANNIKA ANDRAE-THELIN, MATS MYRBERG, BIRGITTA ANDRÉN and KENNETH ABRAHAMSSON, NBE. Seated, from right to left: Professor BIRGITTA ODÉN, Director-General ERLAND RINGBORG and INGER MARKLUND, NBE.

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All human activity
presents opportunities for development.
Education serves to develop the individual
and the community. The conditions applying to this development
in compulsory school, upper secondary school and
adult education are the concern of educational research.
For 25 years now the NBE has been administratively
and financially responsible for research and
development work in schools and education.
More than 70 research projects and
upwards of 20 development projects
are now in progress in various parts of Sweden,
with more than 100 researchers,
many teachers and other school personnel
as well as administrators taking part.

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